



General

Guideline Title

ACR Appropriateness Criteria® chronic hip pain.

Bibliographic Source(s)

Taljanovic MS, Daffner RH, Weissman BN, Appel M, Arnold E, Bancroft LW, Bennett DL, Bleba JS, Bruno MA, Fries IB, Hayes CW, Kransdorf MJ, Luchs JS, Morrison WB, Palestro CJ, Roberts CC, Stoller DW, Tuite MJ, Ward RJ, Wise JN, Zoga AC, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® chronic hip pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 9 p. [89 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Taljanovic M, Daffner RH, Weissman BN, Bennett DL, Bleba JS, Jacobson JA, Morrison WB, Resnik CS, Roberts CC, Schweitzer ME, Seeger LL, Wise JN, Payne WK, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® chronic hip pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 8 p.

The appropriateness criteria are reviewed biennially and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

Recommendations

Major Recommendations

ACR Appropriateness Criteria®

Clinical Condition: Chronic Hip Pain

Variant 1: Initial evaluation for chronic hip pain. First test.

Radiologic Procedure	Rating	Comments	RRL*
X-ray pelvis	9		<input type="text"/> <input type="text"/>
<p>Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate</p> <p>Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate</p>			<p>*Relative Radiation</p>

Radiologic Procedure	Rating	Comments	RRL*
MRI hip without contrast	1		O
MRI hip without and with contrast	1		O
US hip	1		O
CT hips without contrast	1		<input type="text"/> <input type="text"/> <input type="text"/>
CT arthrography hip	1		<input type="text"/> <input type="text"/> <input type="text"/>
MR arthrography hip	1		O
Tc-99m bone scan hip	1		<input type="text"/> <input type="text"/> <input type="text"/>
X-ray arthrography hip with anesthetic with or without corticosteroid	1		NS
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: Radiographs negative, equivocal or nondiagnostic, suspect osseous or surrounding soft-tissue abnormality, excluding osteoid osteoma.

Radiologic Procedure	Rating	Comments	RRL*
MRI hip without contrast	9		O
MRI hip without and with contrast	6	If required after review of noncontrast study. See statement regarding contrast in text under "Anticipated Exceptions."	O
MR arthrography hip	3	If femoroacetabular impingement or labral tear is suspected, see variant 5.	O
US hip	2		O
CT hips without contrast	2		<input type="text"/> <input type="text"/> <input type="text"/>
CT arthrography hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
X-ray arthrography hip with anesthetic with or without corticosteroid	2		NS
Tc-99m bone scan hip	1		<input type="text"/> <input type="text"/> <input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative

Radiologic Procedure	Rating	Comments	Radiation RRL* Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: Radiographs negative, equivocal, or nondiagnostic, suspect osteonecrosis. Includes circumstance in which hip is asymptomatic but osteonecrosis is suspected due to known predisposing factors.

Radiologic Procedure	Rating	Comments	RRL*
MRI hips with or without contrast	9	Contrast may be helpful in specific clinical situations such as differentiating subchondral fracture from osteonecrosis. See statement regarding contrast in text under "Anticipated Exceptions."	O
Tc-99m bone scan hip	5		<input type="text"/> <input type="text"/> <input type="text"/>
US hip	2		O
CT hips without contrast	2		<input type="text"/> <input type="text"/> <input type="text"/>
CT arthrography hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
MR arthrography hip	2		O
X-ray arthrography hip with anesthetic with or without corticosteroid	2		NS
FDG-PET pelvis	1	Further work is needed for establishing the criteria in routine clinical workup. Attenuation correction by radionuclide methods or, more commonly, with CT is considered part of the examination.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 4: Radiograph negative, equivocal or nondiagnostic. Suspect osteoid osteoma.

Radiologic Procedure	Rating	Comments	RRL*
CT hips without contrast	9		<input type="text"/> <input type="text"/> <input type="text"/>
MRI hips with or without contrast	7		O
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Radiologic Procedure	Rating	Comments	RRL*
CT arthrography hip	2		<input type="text"/> <input type="text"/>
X-ray arthrography hip with anesthetic with or without corticosteroid	2		NS
US hip	1		O
MR arthrography hip	1		O
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 5: Radiographs negative, equivocal, or nondiagnostic. Suspect labral tear with or without clinical findings consistent with or suggestive of femoroacetabular impingement.

Radiologic Procedure	Rating	Comments	RRL*
MR arthrography hip	9	May be combined with anesthetic with or without corticosteroid. Use of high resolution (3T) in the future may obviate the need for contrast. See statement regarding contrast in text under "Anticipated Exceptions."	O
CT arthrography hip	7	May be combined with anesthetic with or without corticosteroid. An alternative if MRI is not available or contraindicated.	<input type="text"/> <input type="text"/> <input type="text"/>
MRI hip without contrast	6	Use of high resolution (3T) in the future may obviate the need for contrast.	O
MRI hip with contrast (indirect arthrography)	5	See statement regarding contrast in text under "Anticipated Exceptions."	O
CT hips without contrast	1		<input type="text"/> <input type="text"/> <input type="text"/>
US hip	1	Can be used to guide hip injections.	O
Tc-99m bone scan hip	1		<input type="text"/> <input type="text"/> <input type="text"/>
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 6: Radiographs negative, equivocal, nondiagnostic, or mild osteoarthritis. Suspect referred pain but wish to exclude hip.

Radiologic Procedure	Rating	Comments	RRL*
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Radiologic Procedure	Rating	Comments	RRL*
X-ray arthrography hip with anesthetic with or without corticosteroid			NS
MRI hip without contrast	5	If another imaging study is indicated, MRI is the study of choice.	O
CT hips without contrast	2		<input type="text"/> <input type="text"/> <input type="text"/>
MR arthrography hip	2		O
CT arthrography hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
US hip	2		O
Tc-99m bone scan hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 7: Radiographs positive, arthritis of uncertain type. Infection not a consideration.

Radiologic Procedure	Rating	Comments	RRL*
MRI hips with or without contrast	5	If process is monoarticular or atypical.	O
CT hips without contrast	2		<input type="text"/> <input type="text"/> <input type="text"/>
US hip	2		O
CT arthrography hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
MR arthrography hip	2		O
Tc-99m bone scan hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
X-ray arthrography hip with anesthetic with or without corticosteroid	2		NS
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 8: Radiographs positive, suggestive of pigmented villonodular synovitis or osteochondromatosis.

Radiologic Procedure	Rating	Comments	RRL*
MRI hip without contrast	9		O
CT arthrography hip	5	If MRI is not available or contraindicated.	<input type="text"/> <input type="text"/> <input type="text"/>
MRI hip without and with contrast	2		O
US hip	2		O
CT hips without contrast	2		<input type="text"/> <input type="text"/> <input type="text"/>
MR arthrography hip	2		O
Tc-99m bone scan hip	2		<input type="text"/> <input type="text"/> <input type="text"/>
X-ray arthrography hip with anesthetic with or without corticosteroid	2		NS
<u>Rating Scale:</u> 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Summary of Literature Review

Chronic hip pain and/or groin pain is a perplexing clinical problem. Symptoms may be related to numerous etiologies, including trauma, neoplasms, and arthropathies. Pain may be due to osseous, intra-articular, periarticular, or soft-tissue pathology. Referred pain from the lumbar spine, sacroiliac joints, or knee may add to the potentially confusing clinical picture. Very few references deal specifically with chronic hip pain, although the imaging of specific disorders has been the subject of many articles.

Radiography

Clinical data are essential for selecting the most appropriate imaging techniques in patients with chronic hip pain. Range of motion, gait abnormalities, locking or snapping, duration of symptoms, and pain patterns (e.g., worse at night, increased with exercise, relieved by aspirin) can be very useful for reducing the potentially long list of differential diagnoses. Radiographs should be obtained first in most if not all cases and may provide specific information for common disorders such as osteoarthritis (OA) or less common disorders such as primary bone tumors. Whether the radiographs are normal or not, they are often of considerable value for the selection of additional techniques and for comparison with studies such as magnetic resonance imaging (MRI) examinations and radionuclide bone scans.

Magnetic Resonance Imaging, Positron Emission Tomography, Computed Tomography

MRI is frequently performed after initial radiographs to detect osseous, articular, or soft-tissue abnormalities. It is both highly sensitive and specific for detecting many abnormalities involving the hip or surrounding soft tissues and should in general be the first imaging technique used following radiographs. Osteonecrosis (ON) is probably the most common cause of chronic hip pain for which MRI is routinely used and the disorder for which the appearance and accuracy of MRI have been most thoroughly demonstrated in the literature. Contrast enhancement in the segment proximal to the low-signal band in the femoral head may serve as a supplemental diagnostic measure for differentiating subchondral insufficiency fracture (SIF) from ON. Additionally, the shape of the low-signal-intensity band with frequent concavity of the articular surface in ON may help in distinguishing this entity from SIF, which commonly shows an irregular convexity of the articular surface. Positron emission tomography (PET) with fluorine-18-2-fluoro-2-deoxy-D-glucose (FDG) may have potential utility in the evaluation of early ON of the femoral head and may be ordered when there is high clinical suspicion and negative MRI, but further work is needed for establishing the criteria in routine clinical workup. This

imaging modality may be especially useful if ON is present after resurfacing hip arthroplasty because ON would not be visible on radiographs and would not be detected on MRI secondary to artifact.

Some investigators suggest that proton MRI spectroscopy may be a potential tool for predicting the risk for development of ON. MRI can also accurately detect ON in the asymptomatic, contralateral hip in those cases in which ON of the other hip has been diagnosed by radiographs.

Other causes of chronic painful hip for which MR has been used with considerable success include radiographically occult fractures, acute and chronic soft-tissue injuries, infection and inflammation, and tumors. Intravenous (IV) gadolinium (Gd)-chelate agents are used to differentiate between joint fluid and synovitis. Generally, if the arthritis has an atypical appearance on radiographs, MRI may be helpful for further characterization and the intravenous contrast is rarely needed. The only exceptions to the use of MRI as the primary technique following radiographs are cases of suspected osteoid osteoma, for which computed tomography (CT) should be performed. One study reported that osteoid osteoma can be successfully imaged by dynamic contrast-enhanced MRI. However, the opinion of this expert panel is that the MRI without and/or with IV contrast is generally not widely used and most of time is not needed in diagnosing osteoid osteoma and should be performed under discretion of radiologist if additional information is believed could be gained. For evaluating labral tears MR arthrography should probably be used. Direct MR arthrography with the intra-articular injection of a dilute (1:200) solution of Gd-chelate in saline has been established as a reliable technique for diagnosing of acetabular labral tears that are frequently associated with femoroacetabular impingement (FAI) syndrome and may be an effective tool in assessing acetabular cartilage delamination. However, several investigators suggest that high-resolution MRI with 3T may improve the visualization of the acetabular labrum and the hyaline articular cartilage, which may obviate the need for intra-articular contrast. With appropriate operator expertise, ultrasound (US) may reliably diagnose most of the acetabular labral tears.

Other investigators have obtained satisfactory results in detecting labral and hyaline cartilage lesions with high-resolution MRI of the hip at 1.5T without intra-articular contrast. Hip cartilage abnormalities can also be successfully evaluated by high-resolution CT arthrography. Three-dimensional CT is an accurate tool for quantifying the femoral head-neck concavity, for providing a noninvasive assessment of hips at risk of FAI, and for assessing the femoral offset in OA hip. CT is also useful in evaluating hip dysplasia, including the medial acetabular bone stock, in preoperative planning for hip replacement. Radiotracer uptake in the superior or superomedial aspect of the acetabular rim on skeletal scintigraphy has been reported as a characteristic feature of a labral tear. Absence of this pattern carries a high negative predictive value for the diagnosis. Focal radiotracer uptake on single-photon emission computed tomographic (SPECT) images localized to the superolateral acetabular rim and/or anterolateral femoral head-neck junction shows a moderate sensitivity and specificity in diagnosis of FAI.

Indirect MR Arthrography

Indirect MR arthrography, in which Gd-chelate contrast is administered by IV injection and diffuses into the joint space through the synovium, has been proposed as an alternative to direct MR arthrography for detecting intra-articular disorders. It is faster and easier to perform than direct arthrography and does not require fluoroscopy. It suffers from less consistent enhancement of the joint space as well as inability to distend the joint capsule. Its value in assessing the hyaline articular cartilage and the acetabular labrum of the hip is uncertain.

Joint Injections

Diagnostic and therapeutic joint injections, which can be performed readily at the time of an MRI arthrogram or as dedicated procedures, are useful tools for confirming the location of pain and in some cases helping in its control for a short period. Joint aspiration is also critical in diagnosing the presence of infection or crystal disease. Local articular and extra-articular injections can define the symptomatic site and exclude referred symptoms. Intra-articular injection of a small amount of iodinated contrast medium under fluoroscopic guidance is used to confirm needle position. Sonography can also be used to localize fluid collections for aspiration and to guide therapeutic and/or diagnostic hip injections. Sonography-guided iliopsoas bursal/peritendinous injections may be useful in determining the cause of hip pain.

Bone Scan

In the presence of normal radiographs, and in the absence of ready access to MRI, a bone scan may be a useful technique. Radionuclide bone scans are effective for detecting or excluding subtle osseous abnormalities.

Other Imaging Studies

Other techniques such as fluoroscopic motion studies (with or without intra-articular contrast) and US are useful to evaluate articular and periarticular conditions such as snapping iliopsoas tendon. In one study, real-time US was used to evaluate the snapping iliopsoas tendon. This method is noninvasive, which is an advantage compared with injection of the tendon sheath and fluoroscopic evaluation.

Summary and Recommendations

- Imaging of chronic hip pain is a broad subject, and the imaging assessment of numerous disorders has been described in the literature.

- Clinical data play an important role in patients with chronic hip pain.
- Radiographs should be obtained as the first imaging study and, in general, MRI should be obtained as the next imaging study except in cases of suspected osteoid osteoma or labral tear.
- Direct MR arthrography should be performed if acetabular labral tear is suspected, including patients with clinical evidence of FAI.
- Use of higher field MRI (3T) may obviate the need for intra-articular contrast.
- Other imaging techniques as well as image-guided aspiration have selected roles to play in certain disorders.

Anticipated Exceptions

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m²), and almost never in other patients. There is growing literature regarding NSF. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m². For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Abbreviations

- AP, anterior-posterior
- CT, computed tomography
- FDG-PET, fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography
- MR, magnetic resonance
- MRI, magnetic resonance imaging
- NS, not specified
- Tc, technetium
- US, ultrasound

Relative Radiation Level Designations

Relative Radiation Level*	Adult Effective Dose Estimate Range	Pediatric Effective Dose Estimate Range
O	0 mSv	0 mSv
<div><div></div></div>	<0.1 mSv	<0.03 mSv
<div><div></div><div></div></div>	0.1-1 mSv	0.03-0.3 mSv
<div><div></div><div></div><div></div></div>	1-10 mSv	0.3-3 mSv
<div><div></div><div></div><div></div><div></div></div>	10-30 mSv	3-10 mSv
<div><div></div><div></div><div></div><div></div><div></div></div>	30-100 mSv	10-30 mSv
*RRL assignments for some of the examinations cannot be made, because the actual patient doses in these procedures vary as a function of a number of factors (e.g., region of the body exposed to ionizing radiation, the imaging guidance that is used). The RRLs for these examinations are designated as NS (not specified).		

Clinical Algorithm(s)

Algorithms were not developed from criteria guidelines.

Scope

Disease/Condition(s)

Chronic hip pain

Guideline Category

Diagnosis

Evaluation

Clinical Specialty

Family Practice

Internal Medicine

Neurology

Nuclear Medicine

Oncology

Radiology

Intended Users

Health Plans

Hospitals

Managed Care Organizations

Physicians

Utilization Management

Guideline Objective(s)

To evaluate the appropriateness of initial radiologic examinations for patients with chronic hip pain

Target Population

Patients with chronic hip pain

Interventions and Practices Considered

1. X-ray
 - Pelvis
 - Hip
2. X-ray arthrography, hip, with anesthetic with or without corticosteroid
3. Magnetic resonance imaging (MRI), hip
 - Without contrast
 - Without and with contrast
 - With or without contrast
 - With contrast (indirect arthrography)

4. MR arthrography, hip
5. Ultrasound (US), hip
6. Computed tomography (CT), hips, without contrast
7. CT arthrography, hip
8. Technetium (Tc)-99m bone scan, hip
9. Fluorine-18-2-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET), pelvis

Major Outcomes Considered

Utility of radiologic examinations in differential diagnosis

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Literature Search Procedure

The Medline literature search is based on keywords provided by the topic author. The two general classes of keywords are those related to the condition (e.g., ankle pain, fever) and those that describe the diagnostic or therapeutic intervention of interest (e.g., mammography, MRI).

The search terms and parameters are manipulated to produce the most relevant, current evidence to address the American College of Radiology Appropriateness Criteria (ACR AC) topic being reviewed or developed. Combining the clinical conditions and diagnostic modalities or therapeutic procedures narrows the search to be relevant to the topic. Exploding the term "diagnostic imaging" captures relevant results for diagnostic topics.

The following criteria/limits are used in the searches.

1. Articles that have abstracts available and are concerned with humans.
2. Restrict the search to the year prior to the last topic update or in some cases the author of the topic may specify which year range to use in the search. For new topics, the year range is restricted to the last 5 years unless the topic author provides other instructions.
3. May restrict the search to Adults only or Pediatrics only.
4. Articles consisting of only summaries or case reports are often excluded from final results.

The search strategy may be revised to improve the output as needed.

Number of Source Documents

The total number of source documents identified as the result of the literature search is not known.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Strength of Evidence Key

Category 1 - The conclusions of the study are valid and strongly supported by study design, analysis and results.

Category 2 - The conclusions of the study are likely valid, but study design does not permit certainty.

Category 3 - The conclusions of the study may be valid but the evidence supporting the conclusions is inconclusive or equivocal.

Category 4 - The conclusions of the study may not be valid because the evidence may not be reliable given the study design or analysis.

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The topic author drafts or revises the narrative text summarizing the evidence found in the literature. American College of Radiology (ACR) staff draft an evidence table based on the analysis of the selected literature. These tables rate the strength of the evidence for all articles included in the narrative text.

The expert panel reviews the narrative text, evidence table, and the supporting literature for each of the topic-variant combinations and assigns an appropriateness rating for each procedure listed in the table. Each individual panel member forms his/her own opinion based on his/her interpretation of the available evidence.

More information about the evidence table development process can be found in the ACR Appropriateness Criteria® Evidence Table Development document (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Expert Consensus (Delphi)

Description of Methods Used to Formulate the Recommendations

Modified Delphi Technique

The appropriateness ratings for each of the procedures included in the Appropriateness Criteria topics are determined using a modified Delphi methodology. A series of surveys are conducted to elicit each panelist's expert interpretation of the evidence, based on the available data, regarding the appropriateness of an imaging or therapeutic procedure for a specific clinical scenario. American College of Radiology (ACR) staff distributes surveys to the panelists along with the evidence table and narrative. Each panelist interprets the available evidence and rates each procedure. The surveys are completed by panelists without consulting other panelists. The ratings are a scale between 1 and 9, which is further divided into three categories: 1, 2, or 3 is defined as "usually not appropriate"; 4, 5, or 6 is defined as "may be appropriate"; and 7, 8, or 9 is defined as "usually appropriate." Each panel member assigns one rating for each procedure per survey round. The surveys are collected and the results are tabulated, de-identified and redistributed after each round. A maximum of three rounds are conducted. The modified Delphi technique enables each panelist to express individual interpretations of the evidence and his or her expert opinion without excessive bias from fellow panelists in a simple, standardized and economical process.

Consensus among the panel members must be achieved to determine the final rating for each procedure. Consensus is defined as eighty percent (80%) agreement within a rating category. The final rating is determined by the median of all the ratings once consensus has been reached. Up to three rating rounds are conducted to achieve consensus.

If consensus is not reached, the panel is convened by conference call. The strengths and weaknesses of each imaging procedure that has not reached consensus are discussed and a final rating is proposed. If the panelists on the call agree, the rating is accepted as the panel's consensus. The document is circulated to all the panelists to make the final determination. If consensus cannot be reached on the call or when the document is circulated, "No consensus" appears in the rating column and the reasons for this decision are added to the comment sections.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The recommendations are based on analysis of the current literature and expert panel consensus.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Selection of appropriate radiologic imaging procedures for diagnosis and evaluation of patients with chronic hip pain

Potential Harms

Gadolinium-based Contrast Agents

Nephrogenic systemic fibrosis (NSF) is a disorder with a scleroderma-like presentation and a spectrum of manifestations that can range from limited clinical sequelae to fatality. It appears to be related to both underlying severe renal dysfunction and the administration of gadolinium-based contrast agents. It has occurred primarily in patients on dialysis, rarely in patients with very limited glomerular filtration rate (GFR) (i.e., <30 mL/min/1.73 m²), and almost never in other patients. Although some controversy and lack of clarity remain, there is a consensus that it is advisable to avoid all gadolinium-based contrast agents in dialysis-dependent patients unless the possible benefits clearly outweigh the risk, and to limit the type and amount in patients with estimated GFR rates <30 mL/min/1.73 m². For more information, please see the American College of Radiology (ACR) Manual on Contrast Media (see the "Availability of Companion Documents" field).

Relative Radiation Level (RRL)

Potential adverse health effects associated with radiation exposure are an important factor to consider when selecting the appropriate imaging procedure. Because there is a wide range of radiation exposures associated with different diagnostic procedures, a relative radiation level indication has been included for each imaging examination. The RRLs are based on effective dose, which is a radiation dose quantity that is used to estimate population total radiation risk associated with an imaging procedure. Patients in the pediatric age group are at inherently higher risk from exposure, both because of organ sensitivity and longer life expectancy (relevant to the long latency that appears to accompany radiation exposure). For these reasons, the RRL dose estimate ranges for pediatric examinations are lower as compared to those specified for adults. Additional information regarding radiation dose assessment for imaging examinations can be found in the ACR Appropriateness Criteria® Radiation Dose Assessment Introduction document (see the "Availability of Companion Documents" field).

Qualifying Statements

Qualifying Statements

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Taljanovic MS, Daffner RH, Weissman BN, Appel M, Arnold E, Bancroft LW, Bennett DL, Blebea JS, Bruno MA, Fries IB, Hayes CW, Kransdorf MJ, Luchs JS, Morrison WB, Palestro CJ, Roberts CC, Stoller DW, Tuite MJ, Ward RJ, Wise JN, Zoga AC, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® chronic hip pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2011. 9 p. [89 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

Guideline Developer(s)

American College of Radiology - Medical Specialty Society

Source(s) of Funding

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

Guideline Committee

Committee on Appropriateness Criteria, Expert Panel on Musculoskeletal Imaging

Composition of Group That Authored the Guideline

Panel Members: Mihra S. Taljanovic, MD (*Principal Author*); Richard H. Daffner, MD (*Panel Chair*); Barbara N. Weissman, MD (*Panel Vice-chair*); Marc Appel, MD; Erin Arnold, MD; Laura W. Bancroft, MD; D. Lee Bennett, MD, MA; Judy S. Blebea, MD; Michael A. Bruno, MD; Ian Blair Fries, MD; Curtis W. Hayes, MD; Mark J. Kransdorf, MD; Jonathan S. Luchs, MD; William B. Morrison, MD; Christopher J. Palestro, MD; Catherine C. Roberts, MD; David W. Stoller, MD; Michael J. Tuite, MD; Robert J. Ward, MD; James N. Wise, MD; Adam C. Zoga, MD

Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Taljanovic M, Daffner RH, Weissman BN, Bennett DL, Bleba JS, Jacobson JA, Morrison WB, Resnik CS, Roberts CC, Schweitzer ME, Seeger LL, Wise JN, Payne WK, Expert Panel on Musculoskeletal Imaging. ACR Appropriateness Criteria® chronic hip pain. [online publication]. Reston (VA): American College of Radiology (ACR); 2008. 8 p.

The appropriateness criteria are reviewed biennially and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

Guideline Availability

Electronic copies: Available from the [American College of Radiology \(ACR\) Web site](#) .

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

Availability of Companion Documents

The following are available:

- ACR Appropriateness Criteria® overview. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the [American College of Radiology \(ACR\) Web site](#) .
- ACR Appropriateness Criteria® literature search process. Reston (VA): American College of Radiology; 1 p. Electronic copies: Available in PDF from the [ACR Web site](#) .

- ACR Appropriateness Criteria®. Evidence table development – diagnostic studies. Reston (VA): American College of Radiology; 2013 Nov. 3 p. Electronic copies: Available in PDF from the [ACR Web site](#) .
- ACR Appropriateness Criteria® radiation dose assessment introduction. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in PDF from the [ACR Web site](#) .
- ACR Appropriateness Criteria® manual on contrast media. Reston (VA): American College of Radiology; 90 p. Electronic copies: Available in PDF from the [ACR Web site](#) .
- ACR Appropriateness Criteria® chronic hip pain. Evidence table. Reston (VA): American College of Radiology; 2011. 24 p. Electronic copies: Available from the [ACR Web site](#) .

Patient Resources

None available

NGC Status

This summary was completed by ECRI on May 6, 2001. The information was verified by the guideline developer as of June 29, 2001. This NGC summary was updated by ECRI on November 12, 2004. The information was verified by the guideline developer on December 21, 2004. This summary was updated by ECRI Institute on June 29, 2009. This summary was updated by ECRI Institute on January 13, 2011 following the U.S. Food and Drug Administration (FDA) advisory on gadolinium-based contrast agents. This NGC summary was updated by ECRI Institute on February 28, 2012.

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